TRACE CHEMICAL DETECTION SYSTEM

1. SCOPE

This specification describes the performance and design characteristics of the Trace Chemical Detection System.

2. GENERAL SPECIFICATIONS

2.1 An Ion Mobility Spectrometer (IMS) based system, optimized for the detection of Explosives, Narcotics and CW agents & Toxic Industrial Chemicals is required.

2.2 The system must be capable of collecting and analyzing both particles and vapors.

2.3 The equipment must be compact, light weight for hand-held operation and sufficiently robust to be transported easily to various operating locations.

3. SAMPLE COLLECTION REQUIREMENTS

3.1 The entire system must be designed specifically for the collection and analysis of trace particles and vapors.

3.2 The sample collection methods must be capable of effectively sampling baggage, persons, vehicles, cargo, mail and documents.

3.3 The collected samples shall be analyzed directly without any sample preparation. The sampling media shall not require any treatment or preparation by the users prior to sample collection.

4. OPERATIONAL REQUIREMENTS

4.1 The analysis time shall be 10 seconds in explosive and narcotic particle modes.

4.2 The system shall be ready to use and operational within 15 minutes of power ON.

4.3 The instrument shall identify the detected explosive(s) or narcotic(s) or chemical. The system shall have the capacity to simultaneously detect and identify 40 different substances.

4.4 The false alarm rate must be less than 1%

4.5 The system shall be capable of simple conversion from Explosives mode to Narcotics mode to CW-TICs mode (and vice-versa).

4.6 New substances must be user-programmable in both negative and positive modes.

4.7 The equipment shall be capable of detecting and identifying a wide range of explosives and narcotics at low nano-gram levels, including:
Explosives: TATP, HMTD, TNT, NG. RDX, PETN, Tetryl, Ammonium Nitrate
Narcotics: Cocaine, Heroin, Methamphetamine, THC. LSD
Also Chemical Warfare Agents (CWA's) and Toxic Industrial Chemicals(TIC's) including:
CWA's: GA, GB, GD, GF, HN3, HD, VX, Vsubx
TICs: Ammonia, Chlorine, Ethylene Oxide, Hydrogen Chloride, Hydrogen Cyanide, Hydrogen Fluoride, Nitric Acid Fuming, Phosgene, Sulfer dioxide

4.8 The equipment shall operate on ambient air, and not require any flammable or bottled gases.

4.9 The system must contain an internal calibrant and reactant which will have a lifetime of at least two years before replacing.

4.10 Calibration of the monitoring compounds shall be automatic. The calibrating substances shall be provided by the manufacturer in an easy to use format, which does not require the use of live narcotics or explosives samples, or the use of a solution.

4.11 The detector shall provide audio and visual alarm for detection; it must identify the specific compound detected, and give an indication of the strength of the detection.

4.12 The detection results shall be displayed on an easy to read colour display, providing visual alarm indication for detection, it must identify the specific compound detected, and give an indication of the strength of the detection. The unit shall also have an audio alarm with variable volume level.

4.13 The detector shall have data storage capabilities allowing the storage of up to 200 alarm plasmagrams.

4.14 The detector shall have the ability to upload stored data via a USB port to a PC or laptop with software and cable provided.

5. PHYSICAL AND ENVIRONMENTAL REQUIREMENTS

5.1 The equipment shall operate effectively within a temperature range of 0 to 45 ^{o}C.

5.2 The equipment shall operate effectively within a humidity range of 0 to 95% (non-condensing)

5.3 The system shall operate at the power supply of 110/220 Volt AC (50/60 Hz power) and 12 Volt DC. The battery shall be lithium ion and provide a minimum of 4 hours of operation and have the ability to be charged in or out of the detector.

5.4 The weight of the portable equipment shall not exceed 3.3 kg including the battery.

5.5 The size of the portable equipment shall not exceed 36.5 x 11 x 13 cm